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Status of research on vacuum technology in KRISS

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The vacuum center, KRISS is a research leader in vacuum technology in Korea. The mission of the vacuum center is as follows: to develop metrology for vacuum applications such as vacuum pumps, gauges, materials, components, and process diagnostics; to establish and maintain standardized evaluation methods for vacuum applications; and, finally, to transfer technology and technical data to industries. The vacuum center is continuously trying to establish linkages with industry; the center operates an association that engages in semiconductor process diagnosis for more than 50 companies in a wide-ranging technical exchange. The vacuum center transfers technology and supplies technical data to more than 100 industries each year.

Next, the areas of research that the center is conducting are as follows. The first is pump evaluation technology, which is used to assess the performance (lifetime) of pumps. All pumps to be delivered to Samsung undergo verification at the vacuum center. Second, the center is engaged in the study of parts/materials evaluation technology to assess the performance (lifetime) of parts and materials. Technical data such as the properties of newly developed products are supplied to many companies. The final area of research is plasma technology. Various plasma diagnosis technologies are under development.

Since 2011, the vacuum center has been involved in the “Development of new materials and processes using a system that simulates the space environment;” this is part of a national project under the Ministry of Science, ICT and Future Planning. The center is actively developing source measurement technology for ultra-fine patterned semiconductors, large-area OLEDs, and new materials with the use of the extreme conditions of the space environment. Areas of research include ultra high vacuum and temperature, plasma, and levitation. This project has also led to the launch of a start-up company specializing in OLED components.